

# CHANGE ISSUE – RTCA/DO-242

## MASPS for ADS-B Rev. A

Tracking Information (committee secretary only)	
Change Issue Number	6
Submission Date	1/11/01
Status (open/closed/deferred)	Rev. A - CLOSED
Last Action Date	02/22/02

Short Title for Change Issue:	Broadcasting of information from moving and stationary obstacles in and around airports.
-------------------------------	--

MASPS Document Reference:		Originator Information:	
Entire document (y/n)		Name	Gary Livack / FAA
Section number(s)		Phone	(202) 267-7954
Paragraph number(s)		E-mail	Garret.Livack@faa.gov
Table/Figure number(s)		Other	

Proposed Rationale for Consideration (originator should check all that apply):	
X	Item needed to support of near-term MASPS/MOPS development
X	DO-260/ED-102 1090 MHz Link MOPS Rev A
	ASA MASPS
	TIS-B MASPS
X	UAT MOPS
	Item needed to support applications that have well defined concept of operation
	Has complete application description
	Has initial validation via operational test/evaluation
	Has supporting analysis, if candidate stressing application
	Item needed for harmonization with international requirements
	Item identified during recent ADS-B development activities and operational evaluations
	MASPS clarifications and correction item
	Validation/modification of questioned MASPS requirement item
	Military use provision item
X	New requirement item (must be associated with traffic surveillance to support ASAS)

Nature of Issue:		Editorial		Clarity		Performance	X	Functional
Issue Description:								
<p>The attached comments <b>requesting the broadcast of location information from moving and stationary obstacles in and around airports</b> were presented to the SC-186 plenary in reference to the ballot on the 1090 MHz ADS-B MOPS (DO-260). It was agreed that these issues would be deferred from consideration in DO-260 until they were first considered for inclusion in a future revision of the ADS-B MASPS. Included with the attached comments is the official response from working group 3, which was charted with development of DO-260.</p> <p><u>Note:</u> As a proposal to consolidate IPs 4, 6, 7, 13, 18, and 19 into a single Issue Paper discussing requested additional ADS-B message elements for various applications and users, Working Paper 242A-WP-5-02 was presented to the ad hoc group at their May 2001 meeting. It was the conclusion of the ad hoc group to not consolidate these Issue Papers so that they could each be addressed as separate issues. 242A-WP-5-02 is available for download from the May meeting materials on the WG6 page at &lt;<a href="http://adsb.tc.faa.gov/adsb/186-subf.htm">http://adsb.tc.faa.gov/adsb/186-subf.htm</a>&gt;</p> <p><u>Administrative Action:</u> Added Attachment A on 2/20/01, submitted by Gary Livack which contains discussions on two applications that would require action on this Issue Paper.</p>								

Originator's proposed resolution:

Proposed resolution is attached with comments from DO-260 ballot.

Working Group 6 Deliberations:

May 24, 2001: This Issue Paper was discussed by the ad hoc group at their May 2001 meeting. It was agreed to change the wording of “fixed obstructions” to “fixed obstacles” in the MASPS. Gary Livack agreed to examine section 2.1.2.1.3 and propose additional aircraft/vehicle categories. **[AI 5-15]** These items will be addressed in Revision A, however any additions of new message or report elements to better describe various obstructions, however, will be deferred to a future revision.

August 30, 2001: In response to AI 5-15, Gary Livack presented 242A-WP-7-10. After reviewing 242A-WP-7-10 and Section 2.1.2.1.3 “Category”, WG6 agreed to replace “Fixed Ground or tethered obstruction” with the following three new categories: fixed or movable point obstacle, fixed or movable cluster obstacle, fixed or barrier point obstacle. Also, the number list will become a bulleted list and the “reserved” items will be removed. These changes to 2.1.2.1.3 will close this Issue Paper and are found in the Working Group 6 Final Resolution section of this Issue Paper.

February 1, 2002: This Issue Paper's final resolution was approved by WG6 as part of the review of 242A-WP-11-01a. The final resolution as it appears in 242A-WP-11-01a appears below. This Issue Paper is now considered CLOSED and addressed in DO-242A.

*Working Group 6 Final Resolution on next page.*

Working Group 6 Final Resolution:

Section 2.1.2.1.3 “Category” from DO-242 has been renamed “Emitter Category” in DO-242A. Below is Section 2.1.2.4 which specifies the Emitter Category as it is defined within the Mode Status report for the draft DO-242A delivered to RTCA on March 4, 2002.

**2.1.2.4 Emitter Category**

An ADS-B participant’s “emitter category” is conveyed in the Mode-Status report (§3.4.4 and §3.4.4.5). The emitter category describes the type of A/V or other AD-B participant. The ADS-B system **shall** (R2.13) provide for at least the following emitter categories:

- Light aircraft - 7,000 kg (15,500 lbs) or less (ICAO)
- Small (15,500 to 75,000 lbs)
- Medium aircraft – more than (7,000 to 136,000 kgs) (15,500 to 300,000 lbs)
- Large (75,000 to 300,000 lbs)
- High-Vortex Large (aircraft such as B-757)
- Heavy aircraft 136,000 kg (300,000 lbs) or more (ICAO)
- Highly maneuverable ( > 5g acceleration capability) and high speed (> 400 knots cruise)
- Rotorcraft
- Glider/Sailplane
- Lighter-than-air
- Unmanned Aerial vehicle
- Space/Transatmospheric vehicle
- Ultralight/Hangglider/Paraglider
- Parachutist/Skydiver
- Surface Vehicle - emergency vehicle
- Surface Vehicle - service vehicle
- Point Obstacle (includes tethered balloons)
- Cluster Obstacle
- Line Obstacle

Notes:

1. ICAO Medium aircraft – 7,000 to 136,000 kg (15,500 to 300,000 lbs) can be represented as either small or large aircraft as defined above.
2. Obstacles can be either fixed or movable. Movable obstacles would require a position source.
3. Weights given for determining participant categories are maximum gross weights, not operating weights.
4. The following category code assignments should be considered for aircraft operating in the United States national air space (NAS).

Light :	Less than 7,000 kg (15,500 lb)
Small:	³ 15,500 and < 41,000 lb
Large:	³ 41,000 lb and < 255,000 lb and not in “High Vortex Large” category
High Vortex Large:	Certain other aircraft, including B-757
Heavy:	³ 255,000 lb

**ADS-B 1090 MHz Rev A Comments Related to MASPS Changes  
RTCA SC-186 WG-3/EUROCAE WG-51 SG-1**

#	Comment Author	DO-260 Section	Page	Comment / Rationale	Suggested Resolution
6	Livack (10)	1.3.6 Table 2-9A Table 2-72	11 37 171	<p>Safety issue. Fixed and tethered obstacles, while addressed in general terms in the draft 1090 MOPS, are not addressed well. Additionally, there appears to be no apparent means specified to mark (and thus depict) moving vehicles that create obstructions. Moving obstructions include, for example, vehicles operating on or off hard surface roads on airports, trains operating on railroad tracks immediately adjacent to runway thresholds, and vessels operating on navigable waterways, all of which can create a hazard or obstruction especially on or near airports.</p> <p><b>WG#3 Position:</b> <i>Beyond reasonable scope of any ADS-B system.</i></p>	This is a safety critical item. This message set needs to be included in the MOPS.
7	Livack (11)	1.3.6 Table 2-9A Table 2-72	11 37 171	<p>Safety issue. Catenary and other continuous obstacle depictions are not addressed. There are many other types of obstacles that do not fit well as a point-obstacle depiction, such as tall tree-lines, building clusters, dams, and microwave transmission corridors. These types of obstacles require a more complex message description. Towers supporting catenaries should be depicted and a special representation used for catenaries because the catenary itself may be a significant obstruction. In these cases, catenaries need to be depicted as a linear feature with the adjacent support towers depicted at either end.</p> <p><b>WG#3 Position:</b> <i>Candidate for Nav database rather than an ADS-B system.</i></p>	This is a safety critical item. The message set needs to be included in the MOPS.

## Attachment A

This attachment cites two applications mentioned by people outside of the ad hoc group that could take advantage of more specific requirements on the broadcast and display of fixed and moving obstacles with ADS-B broadcast devices.

Item 1: Stuart Searight received the following e-mail from a pilot that flies helicopters in North Sea Offshore Operations. In this e-mail message, the author suggests that ADS-B ground-based devices be used to mark obstructions. (Obstructions in this context are ships and vessels such as floating oilrigs that create a safety of flight situation because conventional charting methods to depict hazards do not work well in their case).

Suggestion: Once again, the ADS-B MASPS group needs to classify what type of obstacles and obstructions need to be marked, then proceed with ensuring that the MASPS supports such usage.

> Hello Mr. Searight,

>

> Looked into the information on TCAS and ADS-B on your web site. Very interesting! In Norway M-ADS is mandatory.

>

> One of the high risk operations flying offshore is the IFR instrument approach to an offshore installation. This is not a risky operation when there is only one rig within miles, but the situation is quite often that there are three or four drilling rigs within a radius of 7 miles. These rigs move around and their positions are not always reported. The problem is how to manage the risk avoiding collision with rigs in your approach sector. Unlike the fixed wing world where obstacles are reported and minima raised accordingly, offshore pilots have to design their own approach based on certain standards and have to rely on wx-radar to clear the area. There is no NOTAM service offshore!

>

> If the drilling rigs offshore had the (ADS-B) transponder that automatically reported their position and identification the pilots would always see and avoid the obstacles. They could even be able to plan the approach before taking off from home base. This would be a significant step in making the offshore operation safer.

>

> Could somebody reflect over the problem and possibly give me some feedback?

>

> Best regards,

> Capt. Torgny Almhjell

> Flight Safety Advisor

> CHC Helikopter Service

> Norway

Item 2: Recently, an individual suggested that the group consider a suggestion to provide airport construction crews operating on airports with a portable “ADS-B suitcase” to alert pilots that there were men and / or equipment on a closed runway/taxiway. This application, too, needs to be considered in the broader context of how will the MASPS accommodate new suggestions / operational.